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Title of Thesis: **"CONSTRUCTION AND VALIDATION OF AN AD HOC  
QUESTIONNAIRE FOR EXHAUSTION"**

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## ABSTRACT

Title of Thesis: Construction and Validation of an Ad Hoc Questionnaire to Measure Vital Exhaustion

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Vital exhaustion is a psychological construct related to coronary disease. An ad hoc exhaustion questionnaire (AEQ) was constructed using previously collected data from a sample of cardiac patients and normal controls by selecting items from the Profile Mood State (POMS; McNair, Lorr & Droppleman, 1971) and the Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983). The AEQ was developed to examine coronary patient data that did not include an established exhaustion measure, the Maastricht Questionnaire (MQ; Appels, Hoppener & Mulder, 1987). The AEQ had good internal reliability (.91). To validate the AEQ, it was administered to a sample of normal men and women along with the MQ. In addition, hostility, depression, and anxiety questionnaires were administered. The AEQ again had excellent internal reliability ( $r=.96$ ) and was highly correlated with the MQ ( $r=.86$ ). Both the AEQ and the MQ were highly correlated with hostility, depression, and anxiety, and there were no gender differences in any of the construct scores. Thus, the AEQ is a valid measure that is comparable to the MQ and may be used to measure vital exhaustion in coronary patients when an exhaustion questionnaire is not available.

CONSTRUCTION AND VALIDATION  
OF AN  
AD HOC QUESTIONNAIRE TO MEASURE VITAL EXHAUSTION

by

Donna M. Posluszny

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### Introduction

Type A behavior and hostility are psychological characteristics or behaviors that may predispose individuals to coronary artery disease or CAD. In this paper, the construct of vital exhaustion will be discussed. Vital exhaustion, a state characterized by unusual fatigue and a lack of energy, emotional drain, and increased irritability (Appels, 1989), has been associated with various aspects of coronary disease morbidity and mortality. It is similar to depression in that it includes some known characteristics of depression, such as a sad, apathetic mood, loss of sleep and sexual desire, fatigue, and tiredness. However, two other major elements of depression, a negative self-concept and feelings of guilt, are not part of vital exhaustion, nor have they been linked to heart disease. Research has shown that self-blame is rare among coronary patients, as they typically blame others for the occurrence of negative events (Byrne, 1980). Although depressed patients often feel tired too, exhausted individuals are not necessarily depressed. In this way, vital exhaustion can be distinguished from depression.

The time course for the development of exhaustion varies within individuals. A typical case is characterized by a more or less sharp decline in total functioning, taking place six to twelve months before myocardial infarction or MI. However, some patients report a declining slope which started about a year and a half before MI, while other patients report



that they experienced symptoms of vital exhaustion during the two or three months before MI only; as such exhaustion is considered to be a short term risk factor for a CAD event (Appels, 1989). If the feelings of unusual tiredness exist longer than a year and a half, it should be labeled as depression or some other trait, which is distinguished from pure exhaustion. Although vital exhaustion is a relatively new construct with little epidemiological data in the heart disease literature, it has been estimated retrospectively that general exhaustion is experienced by 30 - 60% of all coronary patients in the year before MI (Feinlieb, Simon, Gillium & Marjolis, 1975).

#### Definition of Vital Exhaustion

Vital exhaustion is conceptualized as a set of symptoms or complaints which indicate a breakdown in adaptation to stress (Appels, 1989). As such, exhaustion is hypothesized to be the endpoint of a relatively short period of unsuccessful coping with one or more stressors. In this manner, vital exhaustion conceptually parallels Selye's concept of the stress response. Selye described three stages of the stress response in his General Adaptation Syndrome. The first stage is alarm, followed by the second stage of resistance, and then finally the third stage of exhaustion which is hypothesized to possibly only occur in cases of severe stress. Selye proposes that the body's adaptability or

"adaptation energy" is finite; as such exhaustion occurs when individuals are pushed beyond their limits, and no longer have the resources to cope with the particular stressors. In this sense, vital exhaustion may be thought of as breakdown in coping with stress.

The concept of vital exhaustion stems from an earlier prospective psychiatric study linking mental precursors, including exhaustion, to incidence of MI (Crisp, Queenan & D'Souza, 1984). The subjects were males aged 40-65 and were screened three times during the five year study. Approximately 261 subjects completed the Crown-Crisp Experimental Index, a measure of psychological functioning, and 26 men had MIs during the study. Items that differentiated the men with an MI from those who remained healthy were items that indicated sadness, loss of libido and exhaustion.

#### Evidence Linking Exhaustion with CAD

With this study in mind, Appels and Mulder (1988) set out to conduct a more definitive study to examine if and how exhaustion is linked to future coronary disease. The main purpose of the study was to test the hypothesis that feelings of exhaustion are predictive of MI, independent of past MI, angina pectoris and the standard CAD risk factors of smoking, high blood pressure, high cholesterol levels, glucose intolerance, and the use of anti-hypertensive drugs. These

investigators worked with the municipal health authority to conduct the Rotterdam Civil Servants Study, a periodic health check for city employees. This prospective study began in 1979, and consisted of 3877 males, aged 39-65. At the initial medical exam, standard risk factors for coronary disease were assessed, an EKG was taken, and the Rose questionnaire for angina was given. Also at this time, exhaustion was assessed by an earlier version of the Maastricht questionnaire (MQ), a self-report inventory developed by Appels and colleagues. The cohort was followed up for an average of 4.2 years. These subjects who probably or possibly suffered from angina at screening and those who suffered a MI in the past were excluded from the prospective analyses. During this period, among those who were free of coronary heart disease at screening (3210), 59 subjects experienced an MI; 21 had a fatal MI and 38 had a non-fatal MI. A multiple logistic regression analysis using the MQ as a continuous score revealed that feelings of exhaustion were predictive of future MI when controlling simultaneously for blood pressure, smoking, cholesterol, age and the use of antihypertensive drugs; thus exhaustion appears to be an independent risk factor for MI. No interactions between MQ scores and any of the standard risk factors were found, nor was there a relationship between MQ scores and future occurrence of cancer or ulcer, the only two additional somatic disorders which occurred in at least 20 subjects in the sample. This

indicates that exhaustion may be specific to CAD and not just to any disease in general. In another analysis conducted to estimate the relative importance of each variable in predicting MI, the risk conferred by exhaustion was less than that of age, smoking and cholesterol, but greater than that of systolic blood pressure. It needs to be kept in mind, however, that there may have been subclinical levels of cardiac disease such as atherosclerosis which may have caused the excessive tiredness; as such, a causal relationship cannot be confidently implied from these data. In addition, an analysis of the observed exhaustion - MI association using time as a dependent variable showed a strong decrease in the relative risk of cardiac events occurring during the first, second, third, or fourth year of follow up; that is, the greatest chance for MI was during the first year of the study, followed by the second year, and so on. This data strongly suggests that the predictive power of the MQ over the total follow-up time is based mainly upon its predictive power in the first year of follow-up; thus exhaustion appears to be a short term risk factor. Furthermore, the test-retest stability of the MQ was found only to be 0.30 when retesting was done after four years among a random subsample of 92 participants. This again suggests that exhaustion has a specific time frame, is a short term risk factor, and is not a trait.

In a separate analysis using data from the same sample



of men, the exhaustion-related issue of burnout was addressed (Appels & Schouten, 1991). Burnout is defined as a breakdown in adaptation to stress that leads to a temporary inability to do one's regular job. Burnout symptoms are similar to vital exhaustion, including tiredness, increased irritability, sleep problems, and inability to concentrate. However, in burnout, the person has to stop working because of an overload of stressors. It was found that occurrence of past burnout, as measured retrospectively by a single self-report item, predicted future MI, even after controlling for standard risk factors. In addition, about one third of those who were exhausted before MI had been previously burned out at some time in their lives. Appels and Schouten suggest that a state of exhaustion before myocardial infarction is often a reactivation of earlier periods of severe breakdown in adaptation to stress (Appels & Schouten, 1991).

In sum, the main finding of this prospective study was that exhaustion appears to be a risk factor for future MI. Because those who suffered from angina or past MI at the Time 1 screening were not included in the follow-up analyses, and because exhaustion remained predictive of future MI when controlling for standard risk factors, it may be concluded that a state of exhaustion is associated with an increased risk for future MI, independent of standard risk factors.

Very little is known about mechanisms which could explain the association between vital exhaustion and coronary

heart disease but these mechanisms may be similar to the mechanisms associated with depression. Some researchers attribute the feelings of tiredness to the impaired oxygen supply to the myocardium. Freeman and Nixon (1987) observed an association between some symptoms of exhaustion and the number of symptomatic episodes of ischemia during ambulatory monitoring. These transient periods of ischemia can impair myocardial function and depress left ventricular function; many patients report a poor energy level during these times. While this finding is important, it is not clear if the ischemic episodes cause poor energy levels or if poor energy levels cause ischemia. In addition, exhaustion may be a side effect of medication used in the treatment of heart disease, especially diuretics and beta-blockers (Appels, 1990), or be due to the age of the patient, with older patients becoming tired more easily than younger patients.

In order to begin to understand the mechanism involved in exhaustion and disease, a recent study by Kop (1994) has examined changes in exhaustion levels of coronary patients before and after percutaneous transluminal coronary angioplasty (PTCA). One goal of this study was to measure the effect of successful coronary revascularization on feelings of exhaustion two weeks and six months after surgery. A total of 120 patients were included, and it was found that feelings of exhaustion were not significantly related to poor left ventricular function. Although a positive association was

found between exhaustion and the extent of coronary artery disease before PTCA, disease severity accounted for only a modest portion (4%) of the variance of exhaustion scores. In addition, most of the patients who were exhausted prior to surgery remained exhausted two weeks after surgery. Although not definitive, this study suggests that exhaustion is not solely related to coronary functioning.

#### Assessment of Exhaustion

Vital exhaustion can be assessed by the 21-item Maastricht Questionnaire (MQ; Appels, Hoppener, & Mulder, 1987), or exhaustion can be assessed by an interview (Appels, 1989). The MQ was fully developed in 1987 by Appels, Hoppener, and Mulder, who came to the final version after distributing more lengthy versions to various samples of middle-aged men and selecting the strongest predictors of disease. It was during this process that depression-related items about feelings of guilt and lowered self-esteem were excluded from the measure, since they did not show any relationship to future heart disease. The resulting 21 items of the MQ have a high internal consistency and can be considered to measure a single construct. The time frame of the questionnaire is rather vague, with subjects being asked to rate how they have been feeling "lately." Subjects can answer yes, no, or a question mark for undecided. Scores are determined by summing up all yes responses at two points a

piece, question mark responses at 1 point a piece and giving zero points for no responses.

The mean score in limited previous research is approximately 8 or 9, with the scale range being between 0 and 42. There is no hard clinical cut off score for exhaustion. Previous research has either used the MQ as a continuous score or looked at the score distribution, cutting exhaustion at a score of around 16.

The primary goal of the present study is to construct an ad hoc measure of exhaustion from existing questionnaires so that ultimately we can examine how the global construct of exhaustion may be related to cardiac ischemia. The main purpose for undertaking this project is to examine the exhaustion - cardiac ischemia relationship from data already collected from CAD patients, since we initially did not administer the MQ in this protocol. Thus, this paper will investigate the psychometric properties of an ad hoc exhaustion questionnaire.

### Method

The study consisted of two phases. First, we constructed an ad hoc measure of exhaustion and performed reliability analyses on this scale using questionnaires previously collected from CAD patients and normal controls. Second, this ad hoc measure and the MQ was administered to a new population of normal controls for comparison and



psychometric evaluation.

### Study I: Scale construction

Subjects. This sample consisted of 64 subjects total. There were 16 male CAD subjects with a mean age of 58.6, range of 39-75 years, and 48 normal controls of which 36 were male and 12 were female, with a mean age of 37.1, range of 20-66 years. One intention of using normals for the psychometric portion of the study was to get some idea of exhaustion scores in normal, or non documented CAD, individuals. Similarly, women were included in this group to get an idea of exhaustion scores in women, as much of the published work has included only males.

Procedure. An index of exhaustion similar to the MQ was constructed by pooling selected items from existing questionnaires that were hypothesized to tap components of the exhaustion construct. Specifically, two questionnaires were used for this purpose. The first, the Profile Mood State (POMS; McNair, Lorr & Droppleman, 1971), is a 65-item mood adjective checklist, in which subjects rate their mood for the past week on various items using a 5-point scale. The POMS has several subscales, including a Vigor scale, a Fatigue scale, and a Depression scale. Fifteen items were identified from this questionnaire that may tap into the exhaustion construct, including feelings of being worn out, sluggish, and exhausted (see Appendix A for complete list). The second

questionnaire, the Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983), is a 14-item inventory which assesses perceptions of stress and coping during the last month on a 5-point scale. Seven relevant items were taken from this survey, feeling that difficulties were piling up so high that they could not be overcome them, feeling unable to control important things in life, and feeling nervous and stressed (see Appendix A for complete list). From these selected items was created a 22-item ad hoc exhaustion questionnaire, which will be referred to as the AEQ (see Appendix B). We then tested how well the items on the AEQ intercorrelated in order to determine whether the items all were generally measuring the same psychological construct.

### Results

Study I. We initially began with 27 items, and later dropped 5 items because those items had a low correlation with the rest of the scale. For the final scale, we have computed a Cronbach's alpha of .91 for the AEQ. This analysis was based on a sample of 64 subjects, composed of 16 CAD patients and 48 normals. When we compared the CAD group to the normal group, there was no difference in average AEQ score. Also, these groups did not differ from each other on their general POMS score, referred to as Total Mood Disturbance score, nor any subscale of the POMS, nor on PSS total score. While the mean AEQ score of each group did not differ from one another, the

range of scores did differ, with all the CAD patients endorsing at least some exhaustion questions. All CAD patients had an exhaustion score of at least 10, while some subjects in the normal group reported virtually no exhaustion.

### Study II: Questionnaire Intercorrelations

Subjects. Sixty-two healthy subjects were included in this part of the study. Of the 62 subjects, 41 were male and 21 were female. The mean age was 43.4 years, with a standard deviation of 11.7 years and range of 24 to 75 years. The average education level was at the college graduate level and the mean income was between \$25,000 and \$50,000.

Procedure. For phase two, both the MQ and the AEQ were administered to a new population of both males and females to determine how well the questionnaires correlate with one another and to look at any gender differences. Subjects were mailed packets containing the MQ, the AEQ, and other questionnaires that may be related to exhaustion. These include the Beck Depression Inventory (Beck, 1967), the Taylor Anxiety Scale (Taylor, 1953) and the Cook-Medley Hostility Scale (Cook & Medley, 1954). We correlated the exhaustion measures with the other measures in order to get an idea of the components of exhaustion.

### Results

Study II. The internal reliability for the AEQ was high, with

a Cronbach's alpha of .96 on the sample of 64 subjects. The correlation between AEQ score and MQ score was .86. As a second check for correlation between the two exhaustion measures, we split the range of scores into thirds for both the AEQ and the MQ, labeling scores as "high", "medium", or "low." Next, we took the AEQ score and MQ score for each subject and looked to see whether the scores fell into the same group, or matched. Of the 62 subjects, 36 pairs of scores matched each other, indicating only a fair level of concordance of 58%.

With the sample of 62 normals, AEQ score had a significant negative correlation with age ( $r = -.25$ ;  $p < .05$ ). In addition, AEQ score had a positive significant correlation with Cook-Medley Hostility ( $r = .56$ ), Beck Depression Inventory ( $r = .79$ ), and Taylor Anxiety Scale ( $r = .87$ ) (all  $p < .01$ ; see Table 1).

In the same sample of 62 normals, MQ score had a significant positive correlation with Cook-Medley Hostility ( $r = .58$ ), Beck Depression Inventory ( $r = .87$ ), and Taylor Anxiety Scale ( $r = .84$ ) (all  $p < .01$ ; see Table 1).

Looking specifically at the sample of 41 males, AEQ score was significantly negatively correlated with age ( $r = -.35$ ;  $p < .05$ ), and significantly positively correlated with Cook-Medley Hostility ( $r = .57$ ), Beck Depression Inventory ( $r = .81$ ) and Taylor Anxiety Scale ( $r = .88$ ) (all  $p < .01$ ). For this same sample, MQ score was marginally significantly



correlated with age ( $r = -.30$ ;  $p < .06$ ), and positively significantly correlated with Cook-Medley Hostility ( $r = .59$ ), Beck Depression Inventory ( $r = .88$ ), and Taylor Anxiety Scale ( $r = .84$ ) (all  $p < .01$ ; see Table 2).

Within the sample of 21 females, AEQ score was significantly positively correlated with Cook-Medley Hostility ( $r = .56$ ), Beck Depression Inventory ( $r = .80$ ) and Taylor Anxiety Scale ( $r = .83$ ) (all  $p < .01$ ). For this same sample of women, MQ score was positively correlated with Cook-Medley Hostility ( $r = .60$ ), Beck Depression Inventory ( $r = .90$ ), and Taylor Anxiety Scale ( $r = .85$ ) (all  $p < .01$ ; see Table 3).

### Discussion

From the data, it appears that the ad hoc exhaustion scale is psychometrically similar to the original Maastricht Questionnaire. Both questionnaires are highly correlated with one another and each shows similar levels of correlation with the other questionnaires. However, the exhaustion questionnaires do not classify subjects in agreement well. The less than optimal level of agreement may be due to the sample's narrow range of scores, with many of the mismatched pairs of scores falling just short of the dividing score for the matching category.

In addition, the construct of exhaustion is closely related to other negative affective constructs as indicated by the high correlations with hostility, depression, and anxiety

scores. It is expected that given the normal sample of the study, most individuals would score in the relatively low end of the range for each construct, i.e. report minimal depression, anxiety, and hostility. Of greater interest are the individuals who scored in the high end of the range for these questionnaires. It appears that these individuals did not discriminate one particular construct from another but rather endorsed all negative affect items similarly. Previous research has shown that elevated scores on questionnaires that ask for somatic and psychological symptoms are often influenced by a general tendency to complain (Costa & McCrae, 1987). These complainers are often labelled as neurotic and tend to experience negative, distressing emotions and demonstrate illness behavior, including self-reporting negative symptoms, independent of objective conditions. With this in mind, subjects in study II were asked to report any medical or mental illness at the beginning of the study. Most subjects reported no current medical or mental illness, and there were no differences between the high scoring group and the rest of the sample. Therefore, the high scoring group in this study give further support for the neuroticism concept.

There were no gender differences in exhaustion, which is surprising given that women tend to endorse more negative affect items than men (Collins & Frankenhauser, 1987). Because of this finding, we then looked at levels of hostility, depression, and anxiety in both groups. Again

surprisingly, men and women had similar depression and anxiety levels. However, men had significantly higher levels of hostility than women, which is consistent with previous research (Barefoot, Peterson, Dahlstrom, Siegler, Anderson & Williams, 1991). Again, one thing to keep in mind is that our sample is of normal nonpatient individuals who theoretically are not expected to score high on any clinical measure. The average levels of depression and anxiety reported here by both men and women are in the low, subclinical range so there is not much room for variance in the scores for the two sexes.

In conclusion, it appears that the AEQ is psychometrically sound and taps the same construct of the MQ. This construct is labelled exhaustion, and clearly overlaps with depression, anxiety and hostility. What is not very clear from this study is what specifically differentiates exhaustion from the other negative constructs, especially depression. One possibility for a defining characteristic is sleep disturbance, which was one of the most disease predictive components of the MQ in earlier coronary research. Unfortunately, sleep disturbance was not assessed in this study and no further conclusions can be made.

Future research linking exhaustion to heart disease needs to address two areas. First, we need to look at how feelings of exhaustion are related to behavior. This behavior can be either health-related behavior, as in taking care of oneself, or behavior that is a trigger for a cardiac event,

like physical exertion. In addition, it would be ideal to construct a behavioral measure of exhaustion, as it may more accurately capture exhaustion and supplement the self-report measure. Second, we need to address more specifically the mechanism by which exhaustion is related to heart disease. One possible way to do this is to target myocardial ischemia as a marker of the activity of coronary heart disease and look at how ischemic severity and duration is correlated with feelings of exhaustion.

### References

- Appels, A. (1990). Mental precursors of myocardial infarction. British Journal of Psychiatry, 156, 465-471.
- Appels, A. (1989). Loss of control, vital exhaustion and coronary heart disease. In A. Steptoe & A. Appels (Eds.), Stress, Personal Control, and Health. Brussels-Luxembourg: John Wiley & Sons Ltd.
- Appels, A. (1989). An interview to assess vital exhaustion.
- Appels, A., Hoppener, P. & Mulder, P. (1987). A questionnaire to assess premonitory symptoms of myocardial infarction. International Journal of Cardiology, 17, 15-24.
- Appels, A. & Mulder, P. (1988). Excess fatigue as a precursor of myocardial infarction. European Heart Journal, 9, 758-764.
- Appels, A. & Schouten, E. (1991). Burnout as a risk factor for coronary heart disease. Behavioral Medicine, 53-59.
- Barefoot, J., Peterson, B., Dahlstrom, Siegler, I., Anderson, N., Williams, R. (1991). Hostility patterns and health implications: Correlates of Cook-Medley Hostility Scale



scores in a national survey. Health Psychology, 10, 18-24.

Beck, A. (1967). Depression: Clinical, Experimental, and Theoretical Aspects. New York: Harper & Row.

Cohen, S., Kamarck, T. & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 385-396.

Cook, W. & Medley, D. (1954). Proposed hostility and pharisaic virtue scales for the MMPI. Journal of Applied Psychology, 38, 414-418.

Costa, P. & McCrae, R. (1987). Neuroticism, somatic complaints, and disease: Is the bark worse than the bite? Journal of Personality, 55, 299-316.

Crisp, A., Queenan, M. & D'Souza, M. (1984). Myocardial infarction and the emotional climate. The Lancet, 17, 15-24.

Feinlieb, M., Simon, A., Gillium, R. & Marjolis, J. (1975). Prodromal symptoms and signs of sudden death. Circulation, (Suppl)51, 52, 155-159.

- Freeman, L. & Nixon, P. (1987). Time to rethink the clinical syndrome of angina pectoris? Implications for ambulatory ST monitory. Quarterly Journal of Medicine, 62, 25-32.
- Kop, W.J. (1994). The Predictive Value of Vital Exhaustion in the Clinical Course After Coronary Angioplasty. Maastricht: Universitaire Pers Maastricht.
- McNair, D., Lorr, M. & Droppleman, L. (1971). EITS Manual for the Profile of Mood States. San Diego, CA: Educational and Industrial Testing Service.
- Taylor, J. (1953). A personality scale of manifest anxiety. Journal of Abnormal and Social Psychology, 48, 285-290.

Table 1. Correlation Coefficients of AEQ and MQ Scores with Age, Hostility, Depression, and Anxiety. (n=62)

	<u>AEQ</u>	<u>MQ</u>
AGE	-.25 **	NS
HOSTILITY	.56 ***	.56 ***
DEPRESSION	.79 ***	.87 ***
ANXIETY	.87 ***	.84 ***

\*\*p<.05  
\*\*\*p<.01

Table 2. Correlation Coefficients of AEQ and MQ Scores with Age, Hostility, Depression, and Anxiety.  
(n=41 males)

	<u>AEQ</u>	<u>MQ</u>
AGE	-.35 **	-.30 *
HOSTILITY	.57 ***	.59 ***
DEPRESSION	.81 ***	.88 ***
ANXIETY	.88 ***	.84 ***

\*p<.06  
\*\*p<.05  
\*\*\*p<.01

Table 3. Correlation Coefficients of AEQ and MQ Scores with Age, Hostility, Depression, and Anxiety.  
(n=21 females)

	<u>AEQ</u>	<u>MQ</u>
AGE	NS	NS
HOSTILITY	.56 ***	.60 ***
DEPRESSION	.80 ***	.90 ***
ANXIETY	.83 ***	.85 ***

\*\*\*p<.01

Appendix A

## Profile Mood States (POMS) - selected items

- 4. Worn out
- 5. Unhappy
- 11. Listless
- 14. Sad
- 18. Blue
- 21. Hopeless
- 28. Unable to concentrate
- 29. Fatigued
- 32. Discouraged
- 40. Exhausted
- 44. Gloomy
- 46. Sluggish
- 48. Helpless
- 49. Weary
- 65. Bushed

## Perceived Stress Scale (PSS) - selected items

- 3. Felt nervous and "stressed"?
- 4. Dealt successfully with irritating life hassles? \*\*
- 5. Felt that you were effectively coping with important changes that were occurring in your life? \*\*
- 6. Felt confident about your ability to handle your personal problems? \*\*
- 8. Found that you could not cope with all the things that you had to do?
- 10. Felt that you were on top of things? \*\*
- 14. Felt difficulties were piling up so high that you could not overcome them?

\*\* reverse scored



Below is a list of statements that describe feelings people have. Please circle the number that best describes how you have felt lately. There are no right or wrong answers.

	<u>never</u>				<u>very often</u>
1. Felt nervous and "stressed"?	0	1	2	3	4
2. Felt wornout?	0	1	2	3	4
3. Felt unhappy?	0	1	2	3	4
4. Dealt successfully with irritating life hassles?	0	1	2	3	4
5. Felt listless?	0	1	2	3	4
6. Felt sad?	0	1	2	3	4
7. Felt that you were effectively coping with important changes that were occurring in your life?	0	1	2	3	4
8. Felt hopeless?	0	1	2	3	4
9. Felt unable to concentrate?	0	1	2	3	4
10. Felt confident about your ability to handle your personal problems?	0	1	2	3	4
11. Felt blue?	0	1	2	3	4
12. Felt fatigued?	0	1	2	3	4
13. Felt discouraged?	0	1	2	3	4
14. Found that you could not cope with all the things that you had to do?	0	1	2	3	4
15. Felt exhausted?	0	1	2	3	4
16. Felt gloomy?	0	1	2	3	4
17. Felt that you were on top of things?	0	1	2	3	4
18. Felt bushed?	0	1	2	3	4
19. Felt helpless?	0	1	2	3	4
20. Felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4
21. Felt sluggish?	0	1	2	3	4
22. Felt weary?	0	1	2	3	4

Please answer the following questions about how you feel lately. Decide whether the answer is YES or NO. If you cannot decide, circle the ?. There are no right or wrong answers.

- |   |     |   |    |
|---|-----|---|----|
| 1. Do you often feel tired?   | yes | ? | no |
| 2. Do you often have trouble falling asleep?  | yes | ? | no |
| 3. Do you wake up repeatedly during the night?  | yes | ? | no |
| 4. Do you feel weak all over?   | yes | ? | no |
| 5. Do you have the feeling that you haven't been accomplishing much lately?                   | yes | ? | no |
| 6. Do you have the feeling that you can't cope with everyday problems as well as you used to? | yes | ? | no |
| 7. Do you believe that you have come to a "dead end"?   | yes | ? | no |
| 8. Do you lately feel more listless than before?  | yes | ? | no |
| 9. I enjoy sex as much as ever.   | yes | ? | no |
| 10. Have you experienced a feeling of hopelessness lately?                                    | yes | ? | no |
| 11. Does it take more to grasp a difficult problem than it did a year ago?                    | yes | ? | no |
| 12. Do little things irritate you more lately than they used to?                              | yes | ? | no |
| 13. Do you feel you want to give up trying?   | yes | ? | no |
| 14. I feel fine.  | yes | ? | no |
| 15. Do you sometimes feel that your body is like a battery that is losing its power?          | yes | ? | no |
| 16. Would you want to be dead at times?   | yes | ? | no |
| 17. Do you have the feeling these days that you just don't have what it takes any more?       | yes | ? | no |
| 18. Do you feel dejected?   | yes | ? | no |
| 19. Do you feel like crying sometimes?  | yes | ? | no |
| 20. Do you ever wake up with a feeling of exhaustion and fatigue?                             | yes | ? | no |
| 21. Do you have increasing difficulty in concentrating on a single subject for long?          | yes | ? | no |